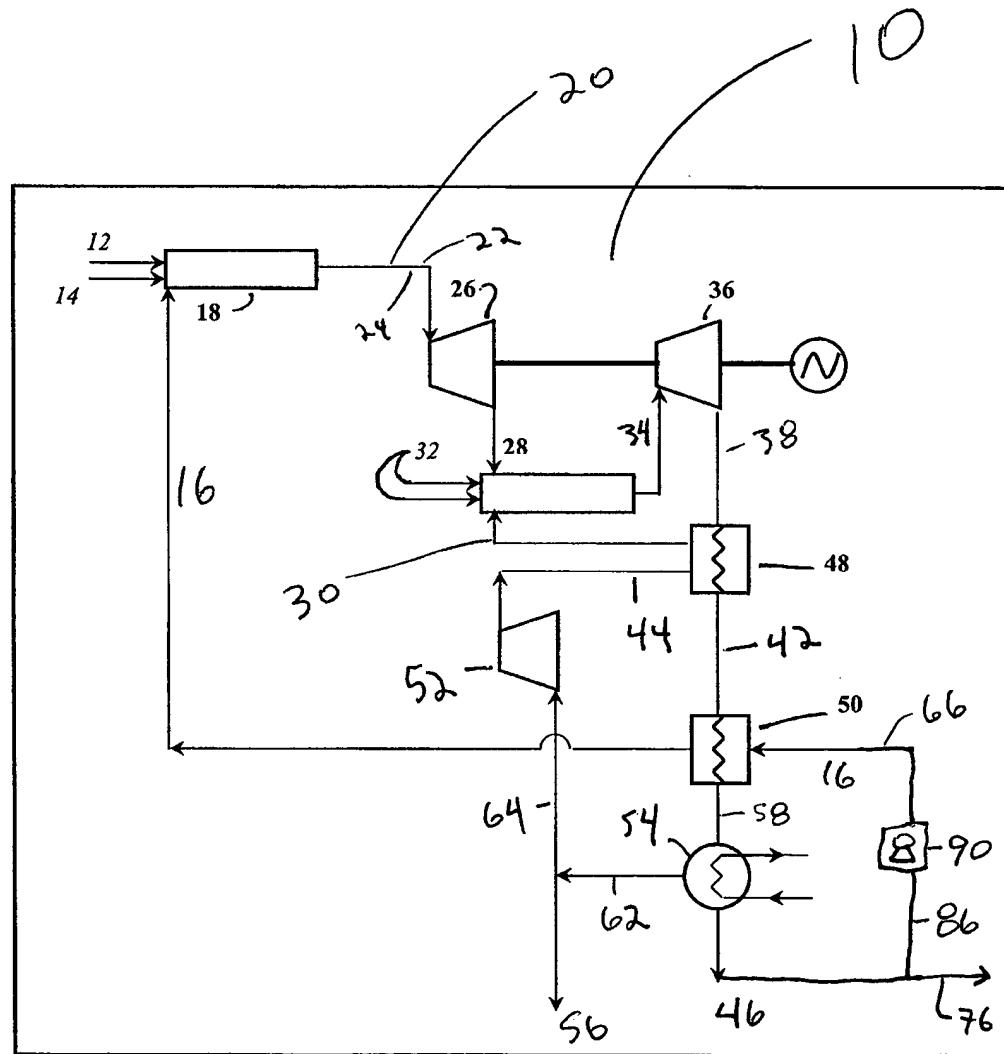
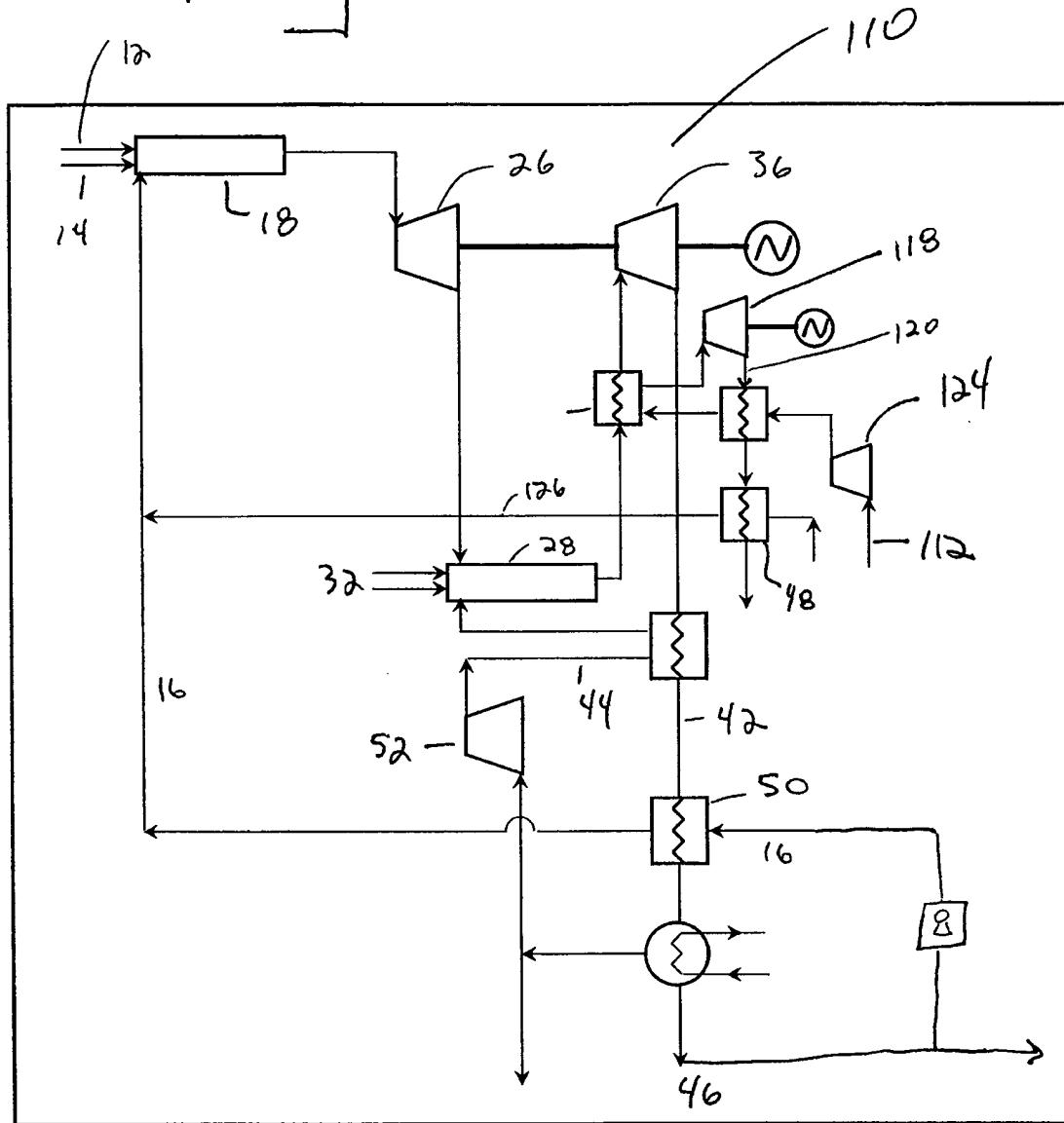


Fig 1



F 15. 2



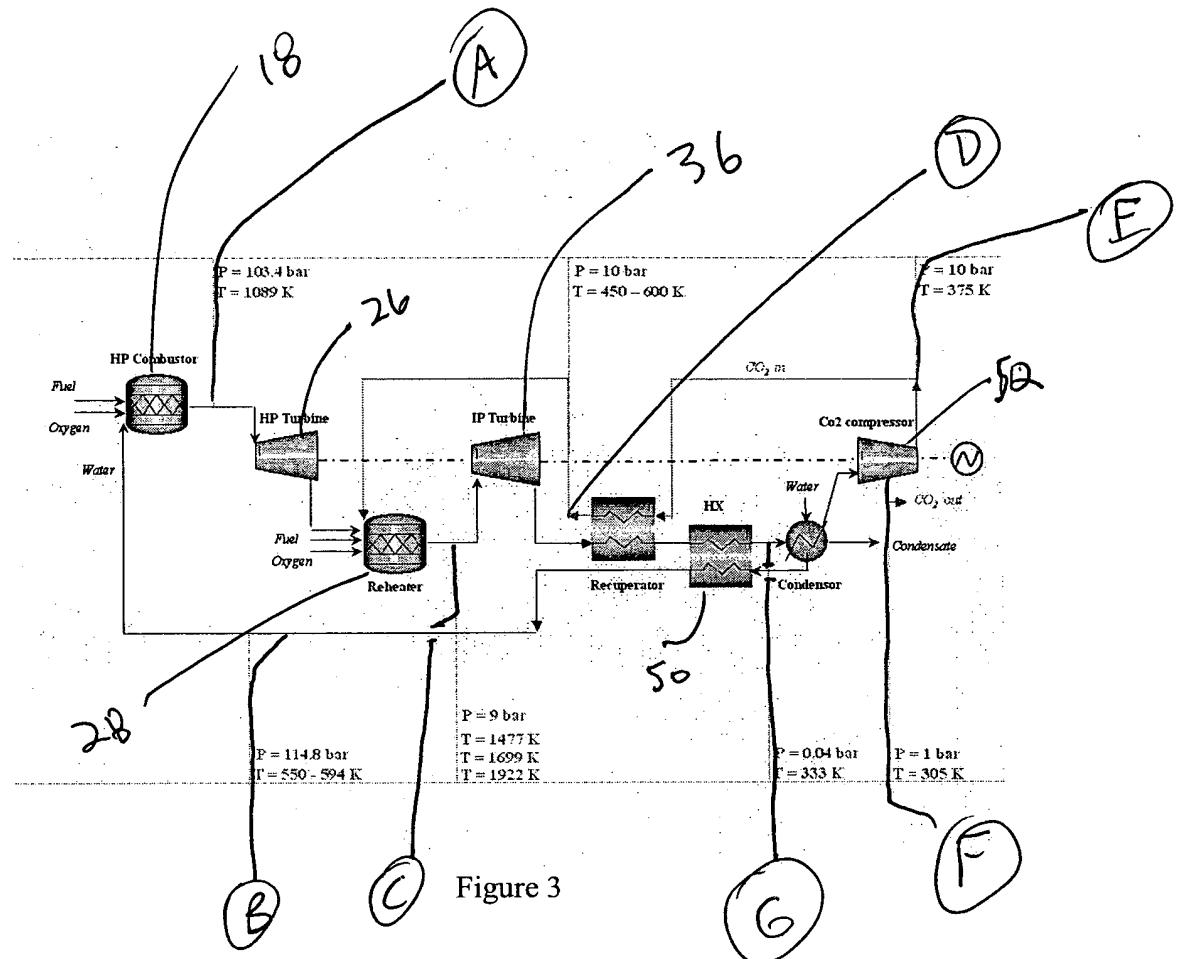


Figure 3

F 1 3

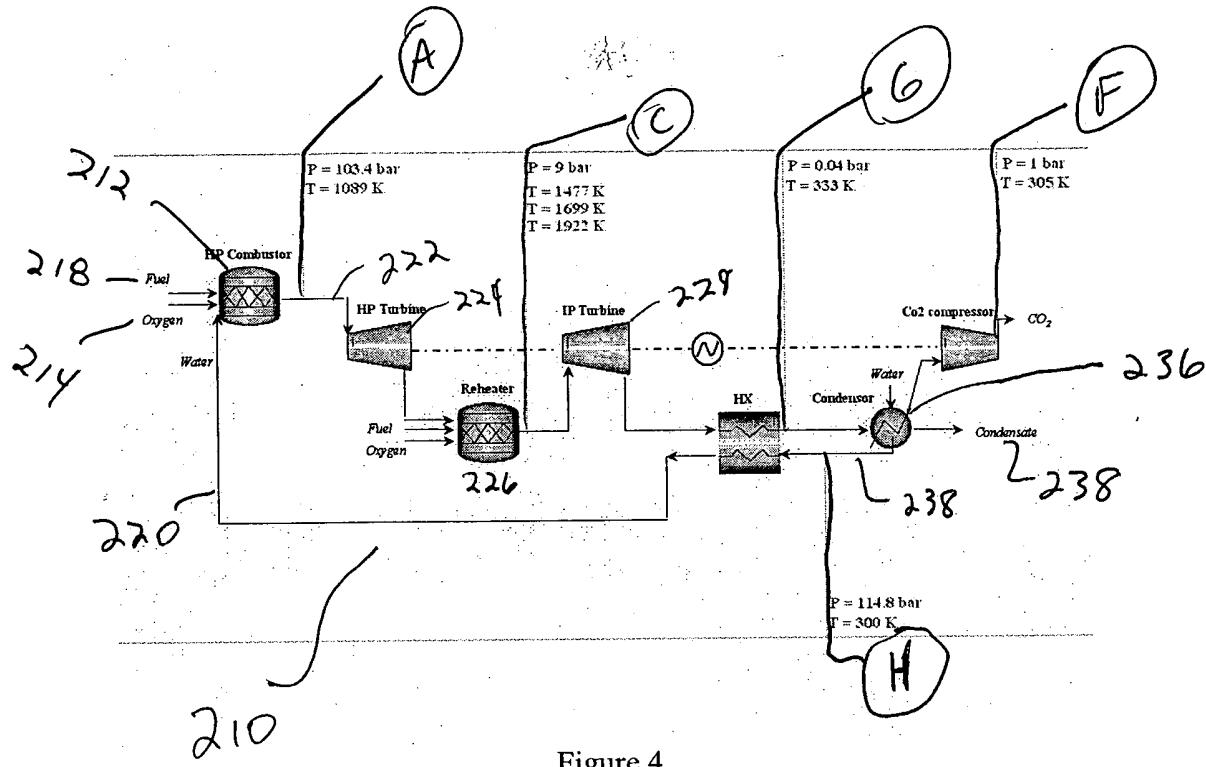


Figure 4

FIG

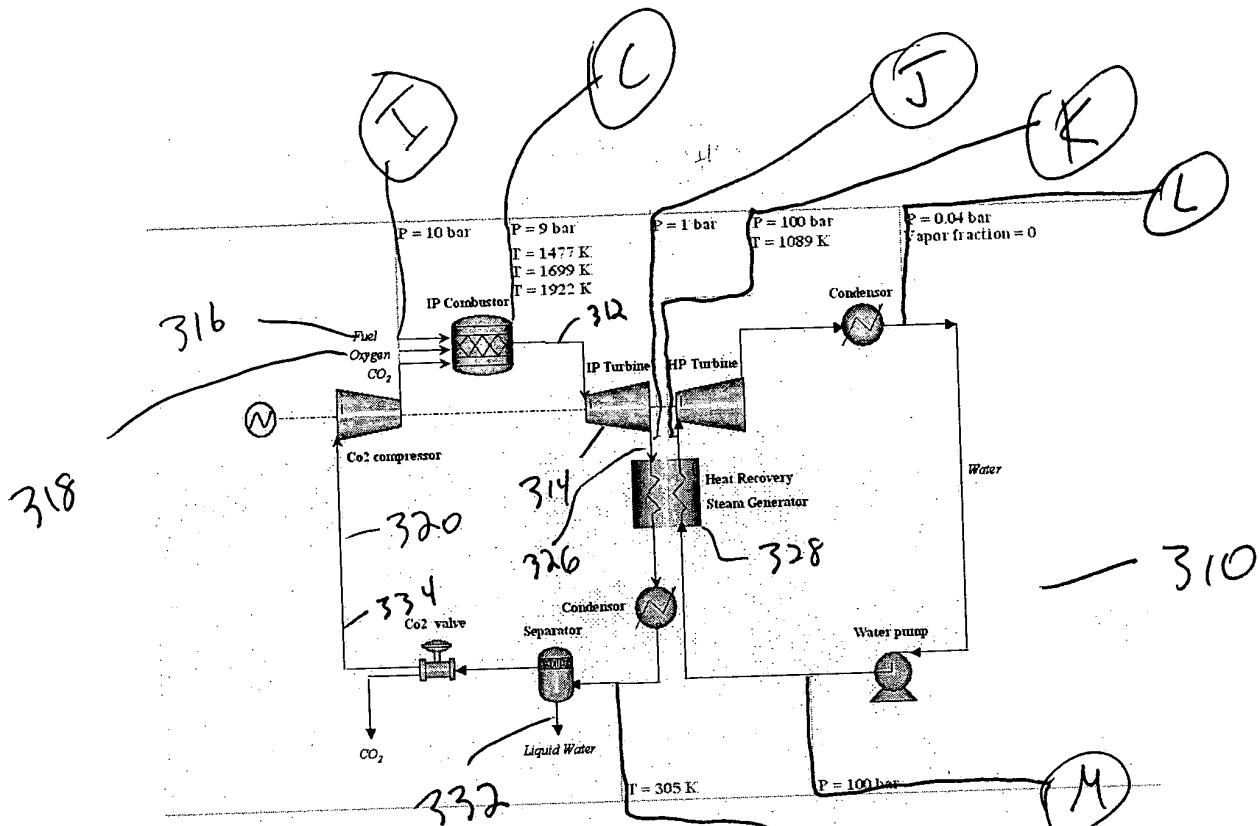


Figure 5.

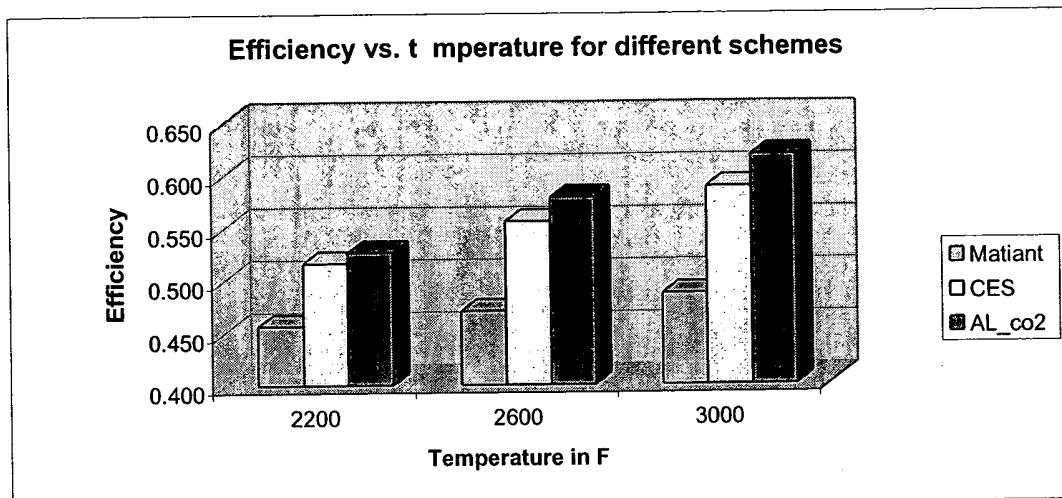


Figure 6

F 1 6

TABLE 7 -- Water Recycle

Fuel	CH4
Temperature inlet	293 K
Pressure inlet	12.41 bar
Oxidant	O2
Temperature inlet	293 K
Pressure inlet	27.58 bar
Fuel 2	CH4
Temperature Inlet	293 K
Pressure inlet	10 bar
Oxidant 2	O2
Temperature inlet	293 K
Pressure inlet	10 bar
o2 &ch4 (HP) (IP)	
Mcompressors	
number of stage	4
method	polytropic
discharge pressure	(114.8) (10) bar
isentropic efficiency	0.8
intercooling	90 F each stg expt last
Pressure drop	0 psi

HP c mbustor	
Pressure outlet	103.4 bar
pressure drop	10%
reaction	complete
Q loss	0=adiabatic
Turb1=Steam turbine HP	
method	isentropic
discharge pressure	10 bar
isentropic efficiency	0.9
Inlet temperature	1089 K
Reheater IP	
Pressure outlet	9 bar
pressure drop	10%
reaction	complete
Q loss	0=adiabatic
Turb2=Gas turbine IP	
method	isentropic
discharge pressure	0.04 bar
isentropic efficiency	0.93
Inlet temperature	2200 2600 3000 F

TABLE 8 -- CO₂ Recycle

Gas turbin side		St am turbine sid
Fuel	CH4	Steam turbin
Temperature Inlet	293 K	method isentropic
Pressure inlet	10 bar	discharge pressure 0.04 Bar
Oxidant	O2	efficiency 0.9
Temperature inlet	293 K	Inlet temperature 1089 K
Pressure inlet	10 bar	
IP combustor		Condensor 2
Pressure outlet	9 bar	hot stream outlet vap frac=0 not taken into account
pressure drop	10%	Pressure drop
reaction	complete	
Q loss	0 W adiabatic	
Gas turbine		Separator 1
method	isentropic	temperature 305 K
discharge pressure	1 bar	pressure 1 bar
efficiency	0.93	Liquid entrainment 0
Inlet temperature	2200 2600 3000 F	
HRSG		Water pump
hot stream outlet	140 F	discharge pressure 2 bar
Pressure drop	not taken into account	efficiency 0.75
Condensor 1		
hot stream outlet	100 F	Water
Pressure drop	not taken into account	Temperature inlet 293 K
(Co2) Mcompressors		Pressure inlet 1 bar
number of stage	4	
method	polytropic	Circulation pump
discharge pressure	10 bar	discharge pressure 100 bar
efficiency	0.8	efficiency 0.75
intercooling	90 F each stg expt last	
Pressure drop	not taken into account	
Water pump		
discharge pressure	2 bar	
efficiency	0.75	
Water		
Temperature inlet	293 K	
Pressure inlet	1 bar	

TABLE 9 -- Preferred Embodiment

Fuel	CH4	HP combustor	
Temperature inlet	293 K	Pressure outlet	103.4 bar
Pressure inlet	12.41 bar	pressure drop	10%
		reaction	complete
Oxidant	O2	Q loss	0=adiabatic
Temperature inlet	293 K		
Pressure inlet	27.58 bar	Turb1=Steam turbine HP	
		method	isentropic
Fuel 2	CH4	discharge pressure	10 bar
Temperature inlet	293 K	isentropic efficiency	0.9
Pressure inlet	10 bar	Inlet temperature	1089 K
Oxidant 2	O2	Reheater IP	
Temperature inlet	293 K	Pressure outlet	9 bar
Pressure inlet	10 bar	pressure drop	10%
		reaction	complete
O2 & ch4 (HP) (IP)		Q loss	0=adiabatic
Mcompressors	4	Turb2=Gas turbine IP	
number of stage		method	polytropic
		discharge pressure	(114.8) (10) bar
		isentropic efficiency	0.8
		intercooling	90 F each stg expt last
		Pressure drop	0 psi
CO2 Mcompressor			
number of stage	3		
method			polytropic
discharge pressure			10 bar
isentropic efficiency			0.8
intercooling			90 F each stg expt last
Pressure drop			0 psi

Fuel	CH4	HP combustor	
Temperature inlet	293 K	Pressure outlet	103.4 bar
Pressure inlet	12.41 bar	pressure drop	10%
		reaction	complete
Oxidant	O2	Q loss	0=adiabatic
Temperature inlet	293 K		
Pressure inlet	27.58 bar	Turb1=Steam turbine HP	
		method	isentropic
Fuel 2	CH4	discharge pressure	10 bar
Temperature inlet	293 K	isentropic efficiency	0.9
Pressure inlet	10 bar	Inlet temperature	1089 K
Oxidant 2	O2	Reheater IP	
Temperature inlet	293 K	Pressure outlet	9 bar
Pressure inlet	10 bar	pressure drop	10%
		reaction	complete
O2 & ch4 (HP) (IP)		Q loss	0=adiabatic
Mcompressors	4	Turb2=Gas turbine IP	
number of stage		method	polytropic
		discharge pressure	(114.8) (10) bar
		isentropic efficiency	0.8
		intercooling	90 F each stg expt last
		Pressure drop	0 psi

Vacuum 'pump' (Mcompressor)			
number of stage	4		
method			polytropic
discharge pressure			1 bar
isentropic efficiency			0.8
intercooling			90 F each stage
Pressure drop			0 psi
HeatX1 = Condensor			
hot stream outlet			333 K
Pressure drop			not taken into account
HeatX B1 = recuperator			
hot stream outlet			605 K
Pressure drop			not taken into account
Air cooler			
hot stream outlet			295 K
Pressure			0.04 bar
Pressure drop			not taken into account
co2 reheater			
hot stream outlet			326.6 K
Pressure drop			not taken into account
Water pump			
discharge pressure			114.8 bar
efficiency			0.75
Wout pump			
discharge pressure			1 bar
efficiency			0.75
Water			
Temperature inlet			293 K
Pressure inlet			1 bar

TABLE 10 -- Comparison

Type of cycle	T HP	T IP	Final Pressure	M.F. CO ₂	M.F. CO ₂	Eff Without seq	Eff With seq
	F	F	Bar	flue gas	recycled		
matiant	1500	2200	1 & 0.04	0.930	0.916	0.456	0.438
matiant	1500	2600	1 & 0.04	0.914	0.893	0.471	0.452
matiant	1500	3000	1 & 0.04	0.868	0.897	0.487	0.468
CES	1500	2200	0.04	0.222	0.000	0.516	0.498
CES	1500	2600	0.04	0.234	0.000	0.556	0.537
CES	1500	3000	0.04	0.246	0.000	0.588	0.570
CO ₂ case2	1500	2200	0.04	0.805	0.890	0.527	0.509
CO ₂ case2	1500	2600	0.04	0.800	0.876	0.579	0.560
CO ₂ case2	1500	3000	0.04	0.785	0.856	0.618	0.599